

Notice of Allowability

Application No.

08/881,948

Examiner

Rodney G. McDonald

Applicant(s)

STRAUSS ET AL.

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1753

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to Amendment filed 11-24-03.
2. ☒ The allowed claim(s) is/are 9-13,23 and 24.
3. ☒ The drawings filed on 25 June 1997 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).
- * Certified copies not received: _____.
5. ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
 - (a) ☐ The translation of the foreign language provisional application has been received.
6. ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application. **THIS THREE-MONTH PERIOD IS NOT EXTENDABLE**

7. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
8. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No. _____.
 - (b) ☐ including changes required by the proposed drawing correction filed _____, which has been approved by the Examiner.
 - (c) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No. _____.

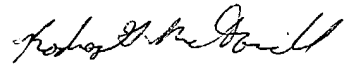
Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the margin according to 37 CFR 1.121(d).

9. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- 1 ☒ Notice of References Cited (PTO-892)
- 2 ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3 ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No. _____
- 4 ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material

- 5 ☐ Notice of Informal Patent Application (PTO-152)
- 6 ☐ Interview Summary (PTO-413), Paper No. _____
- 7 ☒ Examiner's Amendment/Comment
- 8 ☒ Examiner's Statement of Reasons for Allowance
- 9 ☐ Other


Rodney G. McDonald
Primary Examiner
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EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

The application has been amended as follows:

Status indicators have been placed in front of the claims to reflect the status of each of the claims.

The wording of Applicant's pending claims 9-13 and 22-24 as presented by Applicant in the Amendment of November 24, 2003 has not been amended or changed in this Office Action.

Replace all previous sets of claims with the set of claims below now having status indicators.

1. (Cancelled) A target assembly removably mountable in an opening in a wall of a vacuum chamber for processing a substrate by causing sputtering material to be ejected from the target assembly onto the substrate, comprising:

an adapter having a supporting wall, an outer flange extending generally outward from said supporting wall and sized for mounting to said chamber, and an inner flange extending generally inward from said supporting wall,

a target of said sputtering material having a generally planar surface, an outer periphery of said target being sized and configured to fit within said supporting wall of

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said adapter, such that said generally planar surface of said target overlays said inner flange of said adapter; and

mechanic couplers mechanically joining said target to said inner flange of said adapter.

2. (Cancelled) The target assembly of claim 1, wherein said supporting wall has a generally cylindrical shape and said target has a generally disk shape.
3. (Cancelled) The target assembly of claim 1, wherein said inner flange of said adapter defines openings for receiving said mechanical couplers.
4. (Cancelled) The target assembly of claim 3, wherein said target defines openings in said generally planar surface arranged in mating relationship to said openings defined by said inner flange of said adapter.
5. (Cancelled) The target assembly of claim 4 wherein said openings defined in said target are threaded, and said mechanical couplers comprise bolts inserted through the openings defined by said adapter and threaded into said openings defined by said target.
6. (Cancelled) The target assembly of claim 1 wherein said sputtering material is a refractory metal.
7. (Cancelled) The target assembly of claim 1 wherein said sputtering material is one of Titanium, Gold, or Aluminum.
8. (Cancelled) The target assembly claim 1 wherein said sputtering material is in or an oxide thereof.
9. (Currently Amended) A target for installation in a vacuum chamber

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for processing a substrate by causing sputtering material to be ejected from the target onto said substrate, comprising

a disk-shaped section having two planar surfaces and on outer periphery, said disk-shaped section having at least one radically radially-inward step proximate said outer periphery, ~~said disk-shaped section having at least one radially-inward-step proximate said outer periphery,~~

a continuous ring configured backing plate with an adapter having an inner radial flange with having at least one groove therein to accommodate an o-ring, said radial flange being disposed in a mating relationship with said radially-inward step thereby preventing leakage into said vacuum chamber at the interface of said adapter and said vacuum chamber,

said target being manufactured homogeneously of said sputtering material, and

said disk-shaped section defining threaded holes proximate said outer periphery of said disk-shaped section.

10. (Previously Presented) The target of claim 9 wherein said disk-shaped section is sufficiently self-supporting to bear stress arising when said section is mounted to said vacuum chamber supported only proximate said outer periphery, and said chamber is evacuated to initiate sputtering, such that one planar surface of said section is exposed to vacuum pressure while an opposite side thereof is not exposed to reduced pressure.

11 . (Original) The target of claim 9 wherein said sputtering material is a refractory metal.

12. (Previously Presented) The target of claim 9 wherein said sputtering material is one of Titanium, Gold, and Aluminum.

13. (Original) The target of claim 9 wherein said sputtering material is Aluminum or an oxide thereof.

14. (Cancelled) Apparatus for processing a substrate by causing sputtering material to be ejected from a target onto said substrate, comprising:

a vacuum chamber an inner peripheral surface defining an aperture for receiving a target, said inner peripheral surface including a supporting wall and an inner flange extending generally inward from said supporting wall, and an anode for supporting the substrate in proximal face-to-face relation to said target;

a target of said sputtering material having a generally planar surface, an outer periphery of said target being sized and configured to fit within said supporting wall of said chamber, such that said generally planar surface of said target overlays said inner flange of said chamber; and

mechanical couplers mechanically joining said target to said inner flange of said chamber.

15. (Cancelled) The apparatus of claim 14, wherein said supporting wall has a generally cylindrical shape and said target has a generally disk shape.

16. (Cancelled) The apparatus of claim 14, wherein said inner flange of said chamber defines openings for receiving said mechanical couplers.

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17. (Cancelled) The apparatus assembly of claim 16, wherein said target defines openings in said generally planar surface arranged in mating relation to said openings defined by said inner flange of said chamber.

18. (Cancelled) The apparatus of claim 17 wherein said openings defined in said target are threaded, and said mechanical couplers comprise bolts inserted through the openings defined by said chamber and thread into said openings defined by said target.

19. (Cancelled) The apparatus of claim 14 wherein said sputtering material is a refractory metal.

20. (Cancelled) The apparatus of claim 14 wherein said sputtering material is one of Titanium, Gold, or Aluminum.

21. (Cancelled) The apparatus of claim 14 wherein said sputtering material is aluminum or an oxide thereof.

22. (Cancelled) The apparatus of claim 14 wherein said chamber comprises an adapter mounted to said chamber, said adapter comprising said supporting wall and said inner flange.

23. (Previously Presented) The target of claim 9 wherein said disk-shaped section defines threaded holes opening into said at least one radially-inward step, proximate said outer periphery of said disk-shaped section.

24. (Previously Presented) The target of claim 9 wherein said disk-shaped section has two radially-inward steps proximate said outer periphery.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Strauss et al. (U.S. Pat. 5,738,770), *the parent application having the same inventors*, teach a target assembly with an adapter and target. Strauss et al. '770 fail to suggest in their claims the continuous ring backing plate with an adapter having an inner radial flange having at least one groove therein to accommodate an o-ring.

The following is an examiner's statement of reasons for allowance:

Claims 9-13, 23 and 24 are allowable over the prior art of record because the prior art of record fails to teach the claimed target having a continuous ring configured backing plate with an adapter having an inner radial flange having at least one groove therein to accommodate an O-ring, the radial flange being disposed in a mating relationship with the radially-inward step of the target thereby preventing leakage into the vacuum chamber at the interface of the adapter and the vacuum chamber.

The closest prior art of record fails to teach a continuous ring configured backing plate, wherein the backing plate has a radial flange disposed in a mating relationship with a radially-inward step of the claimed target. Furthermore Strauss et al. (U.S. Pat. 5,738,770), *the parent application with the same inventors discussed above*, teach a target assembly with adapter and target in their claims but fails to disclose in their claims the continuous ring backing plate with an adapter having an inner radial flange having at least one groove therein to accommodate an o-ring.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rodney G. McDonald whose telephone number is 571-272-1340. The examiner can normally be reached on M- Th with Every other Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam X. Nguyen can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 571-272-1300.



Rodney G. McDonald
Primary Examiner
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RM
January 29, 2004